



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

The American Midland Naturalist

PUBLISHED BI-MONTHLY BY THE UNIVERSITY
OF NOTRE DAME, NOTRE DAME, INDIANA

VOL. VI.

JANUARY, 1920.

NO. 7

Household Insects and their Remedies.

BY B. W. SCHEIB.

PREFACE.

Household insects are demanding more attention today than ever before. In the careful research for the causes of human diseases it has been found that many of these pests are carriers of bacteria and disease. In addition to this, they are very annoying and also do hundreds of dollars worth of damage to clothes, household furnishings and supplies. During the past years, the author of this essay has had a great many inquiries for exterminating them. In nearly every case the housewives readily recognized the insects but were not acquainted with the best methods of control. Thus a scientific technical description of each insect was thought to be unnecessary and, in the descriptions given, the writer has tried to use such language that would be readily understood by the average housewife. Usually the housewife is not interested in the insects further than to eradicate the pests. With this in view, the writer has tried to set forth the simplest and most economical remedies for the destruction of some of the most common household insects. The author does not claim to have originated all of these remedies but they have been carefully gleaned from various sources. Nearly all of these remedies have been tried by the writer or on recommendation to his friends and have been found to be most satisfactory.

THE HOUSE FLY.

The most common and most widely distributed household pest is the common house fly (*Musca domestica*). This insect is now attracting wide attention as a carrier of disease. It has been known to carry typhoid fever, tuberculosis, cholera, cholera infantum and dysentery and no doubt a great many other diseases.

Its early stages are passed in some moist, decaying matter, generally horse manure or barn yard filth. It is not an uncommon thing to find flies feeding on sputum and all kinds of filth; thus they pick up a great number of harmful bacteria on their feet, mouth and hairs and are carried to groceries and other eatables of all sorts. Dr. L. O. Howard has estimated that the house fly is the cause of 250,000 typhoid fever cases in America. As a general rule flies do not travel more than two or three hundred yards away from their breeding place. Bacteria have been known to live in flies for three weeks. Thus flies can distribute bacteria in a great many places without revisiting the source from which it first received its deadly germs.

Since flies are known to carry disease, it is very essential to do everything to get rid of them in our homes. Proper screening of the house is one of the first requisites. The next step should be to remove their breeding places. Manure should be removed at least once a week. Chloride of lime sprinkled over the manure each day will to a large extent prevent their breeding.

I.

Flies may be killed by using the following:

- 1 oz of formalin 40%
- 16 oz of sweet milk
- 16 oz of water

Pour this into a dish and set it where the flies can get at it. It is always well to float a piece of cork or blotting paper on the liquid so the flies can have more room to eat. Flies eat this readily and are killed by the thousands.

II.

The following has been used with good success:

- 1 cup brown sugar
- 1 cup of formaldehyde

Mix the two together. Should the solution dry up a little water can be added from time to time.

III.

Take an infusion of

- Quassia 1 pt
- Brown sugar 4 oz
- Ground pepper 2 oz

To be well mixed together and put in small shallow dishes where required.

IV.

Take some jars, mugs or tumblers, fill them half full with soapy water; cover them as jam pots are covered with a piece of paper, either tied down or tucked under a rim. Let this be rubbed inside with wet sugar, mollasses, honey or jam or anything sweet. Cut a small hole in the center large enough for a fly to enter. The flies settle on the top attracted by the smell of the bait; they then crawl through the hole, to feed upon the sweet beneath. Meanwhile the warmth of the weather causes the soapy water to ferment, and produces a gas which overpowers the flies and they drop down into the vessel. Thousands may be destroyed this way and the traps last a long time.

V.

Fly traps and tanglefoot also help in reducing the amount of flies.

VI.

It is not always possible to avoid collections of manure, but these collections or piles may be sterilized successfully and made impossible as breeding nests simply by the generous distribution of sulphate of iron, in liquid or dry form. It gives better results than kerosene, for it does not harm the manure, and the cost is very light. It penetrates everywhere. By keeping constantly in the stable a barrel of this solution of a strength of about two pounds for each gallon of water and using a common sprinkler can, the sterilization would be accomplished at an approximate cost of less than 1 cent per horse per day. Making sanitary all other breeding spots, such as garbage cans and privy boxes may be accomplished by the liquid solution or dry sugar sulphate of iron being distributed freely, thus checking in the earliest stages the development of fly maggots. And this is the time for effective work, because the fly larvae or eggs are exceedingly tenacious of life. Sulphate of iron, being a deodorizer, also removes from the manure pile, the urine soaked stable drains, the outhouse and the garbage pile the pungent ammoniacal fumes and other offensive smells. Use of this chemical in cellars where rotting vegetables may be found purifies the air.

Chloride of lime is also good.

MOSQUITOES.

There are a great many species of mosquitoes. They are

not only a nuisance but are also conveyors of malaria, yellow fever and denque fever. In some localities a great deal of work has been done to rid the communities of this pest. The immature stage are found in water. They breed in any place where there is open water. Rain water barrels, tin cans, water troughs and stagnant mud holes are generally the breeding places of these pests. The eggs are laid on top of the water in rafts and as they hatch the larva begin feeding upon the minute vegetable and organic matter found in the water. The first step toward exterminating mosquitoes should always be to destroy their breeding places.

Destroying Breeding Places.

One of the best methods is to pour oil upon the surface of the water. All ponds and mud puddles that can be drained should be drained. Rain water barrels and all vessels holding water should be screened. Frequently if the weeds are cut around ditches and low depressions holding water the breeding place will dry out immediately.

All tin cans should be buried or disposed of immediately. All ornamental fish ponds and water gardens should be supplied with fish that will eat the wrigglers.

Screens.

Every home should have the windows and doors thoroughly screened. Twenty meshes to the inch can be relied upon to keep mosquitoes out but fifteen to the inch is better. When mosquitoes are very numerous the screens should be painted lightly with kerosene or oil of citronella. When buying screens it will be found to be more economical to buy the brass wire screen as it will not rust out like iron wire screen. The proper housing and painting of screens will lengthen their period of usefulness materially.

Smudges and Fumigants.

Anything that will make a dense smoke will drive away mosquitoes. The writer has found that straw makes an excellent smudge for out-door parties. Campers frequently use dried leaves. For household use other material must be used.

I.

Pyrethrin Powder.

Pyrethrin Powder can be purchased at any drug store. The powder should be heaped up on a tin pan in the form of a cone

and the tip then lighted. It burns quite readily and makes a dense pungent smoke. If the powder does not burn well it can be sprinkled over red hot coals. This method is not very effective where the windows are left open. The essential thing is the volatile oil given off into the room from the burning powder and stupifies the insect.

II.

Jimson Weed.

Dr. John B. Smith recommends the following:

1 oz of salt peter

3 oz powdered jimson weed (*Dotura stramonium*).

About ten ounces of this should be burned per 1,000 cubic feet of space. He states that the fumes are not injurious to humans, fabrics or metal. The powder should be burned on a tin pan or shovel.

III.

Nimms Culicide.

Mix equal parts by weight of carbolic acid crystals and gum of camphor. The carbolic acid crystals are melted over a gentle heat and poured over the gum. The gum is dissolved and the resultant is a clear liquid with a pleasing odor. The vapor is not injurious to human beings except when very dense, but it will produce headache if breathed too freely. Rooms should be as nearly air tight as possible.

IV.

Protection from Bites.

One of the best mixtures to keep mosquitoes away is made from the following:

Oil of citronella 1 oz

Spirits of camphor 1 oz

Oil of cedar ½ oz

A few drops on a bath towel and hung on the head of the bed will keep the common mosquito away for a time. Where mosquitoes are real bad some of the liquid should be rubbed on the face and hands. This mixture will not last the entire night.

V.

Mr. E. H. Gane of New York recommends the following to avoid the odor of the oil of citronella.

Castor oil 1 oz

Alcohol 1 oz

VI.

The writer has found the following to be effective:

Kerosene	1 oz
Oil of cedar	1 oz
Oil of citronella	1 oz

Place a few drops on clothes and hang them near the bed. The odor of this is not offensive.

COCK ROACHES.

Cock roaches eat any kind of food, and frequently do a great deal of damage. They are nocturnal and live in damp, dark places, generally about sinks or water places, flour bins and pantries. They have a nauseating odor and want to live around garbage. The thoughts of eating the food is intolerable. By some they are thought to be carriers of disease. There are four kinds of roaches in this country: The American Cock Roach (*Periplaneta americana* Linn), the Oriental Cock Roach (*Blatta orientalis* Linn), Australian Roach (*Periplaneta australasiae* Fab) and the German Roach or "Cero-ton Bug" (*Blatella germanica* Linn).

They are wingless and all have flat, thin bodies, and strong, biting jaws. As they live in cracks and under objects it is not easy to exterminate them. Boiling water and good soap suds will aid some in keeping down this pest. Dr. Hodges states the bat and the common toad to be very effective in exterminating this pest.

I.

Borax is the best cock roach exterminator yet discovered. The cockroach has a peculiar aversion to it, and will never return where it has been once scattered. This salt is perfectly harmless to human being and is to be much preferred.

II.

A mixture of red lead, corn meal and mollasses will be eaten eagerly by them and will soon exterminate them.

III.

Large numbers may be killed by setting out two shallow dishes, one containing flour and plaster of Paris mixed together and the other water. Use four parts of flour to one part of plaster of Paris. Arrange the dishes so that roaches can easily climb on them and from one dish to the other.

IV.

Make a strong decoction of poke roots, when the strength is out of the roots, mix the liquor with molasses and spread it on

large plates in the places they frequent. They may be thus slain by the thousands.

Mix equal parts of Persian insect powder and powdered Levantic wormseed, and scatter the mixture about the places which cock roaches frequent.

VI.

Carbon bisulphite may also be used as a fumigant and will undoubtedly prove satisfactory if used in sufficient quantities. This, however, is very inflammable and one must be careful about fire.

VII.

Equal parts of 2% carbolic acid and 2 oz. gum camphor dissolved poured into cracks will get them out where they may easily be killed.

VIII.

Burning pyrethium in infested places is very effective. Room should be closed for several hours.

IX.

Phosphorus paste, which may be purchased at drug stores is claimed to be satisfactory.

X.

Scatter cucumber parings around the parts of the house troubled with these vermins.

HOUSE CRICKET.

(*Gryllus domesticus* Linn)

These insects are quite common and at times do considerable damage to clothing. They often damage clothes hung in a dark and damp closet or clothespress; also hiding in fireplaces, pantries and baseboards. The house cricket shows a special fondness for liquids such as milk, and may be found in the milk pans if left uncovered. The crickets vary from brown to black according to the species. The head has two very long antennae, the hind legs are large and strongly developed for jumping. The chirping is done entirely by the male by elevating the outer wings or tegminae, and then scraping them together, one over the other, thus producing a vibration. It is supposed to be a call from the male to the female.

I.

Crickets like milk, fresh potatoes, carrots; so many are killed

by putting arsenic in the liquid and sprinkling a little on a scraped potato or carrot.

II.

Some find putting a little chloride of lime and powdered tobacco in their holes very effective.

III.

Sprinkle a little quicklime near to the cracks through which they enter the room. The lime may be laid down at night and swept up early in the morning, as it must be kept entirely away from children. This kills many of the crickets and drives them away from the house.

THE LITTLE RED ANT.

(*Monomorium pharaonis* Linn)

The origin of this species is unknown but it is supposed to have been imported. This is one of the most despised, troublesome and prolific of household pests. They nest in partitions, under floors, in all cracks and crevices where it is hard to reach them. These insects pass their entire existence in houses. They are about one-twentieth of an inch in length.

Another ant which is also a nuisance is the black ant. Ants particularly like sugar, syrup and other sweets. Ants are not so destructive to the household supplies, but their faculty of getting into everything makes them very disagreeable to say the least.

Those that are commonly known are all workers. The females stay in the colony and are known by being wingless. These wings are torn off as soon as the ants begin mating. The male usually dies and the female at once goes to her duty of establishing new colonies. Unless the colony can be reached and destroyed all other measures will be of only temporary relief.

I.

If these nests can be reached, a little kerosene or bisulphide of carbon sprayed or injected, is very effective.

II.

Fumigation with hydrocyanic acid gas is advisable in old and badly infested houses. Care must be used with this gas.

III.

To keep ants from climbing upon tables, cupboards, etc., place the legs in small dishes or pans of kerosene or water.

IV.

The writer has found it very effective to keep everything out of the way of these pests. By care they can be done away with almost as easily as flies.

V.

A few leaves of green wormwood scattered on shelves, etc., is good for black ants.

Powdered borax sprinkled in shelves, etc., will aid greatly in eradicating the pest.

VI.

Some people advise using methods of attracting the ants, such as a sponge soaked in sugar and water, and as they gather on the sponge, dip quickly in hot water. Also place a little poison is sugar, lard, etc., and some have found this effective.

SOUTHERN CLOTH MOTH.

(*Tincola viselliella*)

This moth is straw color without spots. The larva spins a silken web, eats hair, feathers and furs.

THE CASE-MAKING CLOTHES MOTH.

(*Tinea peliionella* Linn)

These moths, or millers as they are called, are harmless in themselves. Their mission is to lay the eggs for the next generation. These moths are night fliers and one sees them about dusk or during the evening flying about in the dark corners of the room. They are seldom seen during the daytime except when driven from their hiding place. The adult moth is very small and delicate. It measures 2-5 of an inch when its wings are expanded. Its fore wings are yellowish-gray, marked with a few undefined brownish spots and fringed toward the outer portion of the posterior margin. The hind wings are of a uniform size, about $\frac{2}{3}$ of the length of the fore wings. Its posterior margin has a wide fringe gradually increasing in length toward the base or wing attachment. Their minute white eggs are usually layed in some dark corner on carpets, woolen goods, furs, and etc. The eggs hatch into a small brown headed caterpillar. The larva begins feeding at once and at the same time constructing a small, bag-like case which is made of fragments of wool. The case is enlarged from time to time as the caterpillar grows. When the caterpillar is

full grown it closes up the case and goes into the pupa state. They emerge from these cases usually in July or August. There are two other species of clothes moths.

TAPESTRY MOTH.

(*Trichophhaga tapetzella*)

The basal half of the fore wing of this moth is white and the rest of the wing is black. The larva construct burrows in which it spins its silken lining. It feeds on coarser fabrics, tapestries, carpets, and upholstered goods.

Take equal parts of oil of camphor and spirits of turpentine. Soak blotting paper in the mixture. Let the paper dry, then lay among furs or clothing.

I.

Clothes moth is most destructive in summer, when woolen goods are stored away.

II.

Clothes should be hung out and sunned good and brushed and beaten thoroughly, then packed in a cedar chest or with cedar chips. Clothes should be wrapped in tar, paper, or bags to keep the female from laying her eggs on them.

III.

Benzine and naphtha used as a spray is also good.

IV.

Upholstered furniture and rugs should be sprayed with gasoline twice a year.

V.

Naphthaline or moth balls will aid considerable in keeping these moths in control.

CARPET BEETLE OR BUFFALO MOTH.

(*Anthrenus scophulariae* Linn)

The adult insect is small, measuring about $\frac{1}{8}$ of an inch in length. This beetle is of European origin. They breed especially on Spiraea and it is supposed they are carried into the house on the blossoms of the Spiraea and kindred flowers. The eggs of the adult female hatch out in a few days and commence feeding immediately. They show a preference for woolen goods, furs and feathers, especially places where they are stored, as they are not

so likely to be disturbed. They also live in the cracks of floors and feed on the underside of rugs and carpets. This is very destructive. They usually mature three broods yearly, according to the length of the summer.

I.

Spray carpet with gasoline and wash all cracks with hot suds and follow by gasoline.

II.

Benzine and gasoline.

III.

Tar paper on floors will keep them away.

IV.

Iron the carpet a part as a time with a wet cloth. This will kill them.

V.

Mothballs are good to pack with winter clothing.

VI.

Sulphur dioxide generated by burning flowers of sulphur is used, but it blackens silver and changes tints in wall paper, also ruins the colors in woollens.

SILVER FISH MOTH.

(*Lepisma sp.*)

This insect is of a silvery-gray, wingless and if touched will leave tiny scales on the fingers. These insects are about $\frac{3}{8}$ inch long, with two long feelers or antennae protruding from the head, while there is three feelers at the hind end of the body. The pest prefers darkness, and is often found among undisturbed books, papers, or starched linens, as it exists on starchy products. As soon as these insects are disturbed, they may be seen scurrying away to hiding places.

I.

Pyrethrin dusted into places where it hides will kill them.

II.

The frequent handling of articles liable to be attacked is one of the best preventives.

III.

Naphthaline scattered among books and materials containing starchy mixtures is an excellent remedy.

IV.

Gasoline is also used very successfully, but should be used with caution where there are stoves and lights, for when used in large quantities it may cause an explosion or fire.

BOOK LICE.

(*Atropos sp. and Clothilla sp.*)

This insect is always found among old books, papers, starchy materials, and have been known to infest old mattresses. They have a peculiar ticking noise, which they make. They are so small in size, one can hardly see them, and does not really belong to the true lice in size and their foods are mainly starchy foods, while the true lice are sucking insects. The antennae is very long on these pests.

I.

The use of naphthalene in boxes and trunks will aid greatly in keeping these pests away.

II.

Infested mattresses stuffed with straw or corn husks should be ripped up and the contents burned. If the mattress is made of hair, it would pay to have it steam cleaned, thus all insects would be killed.

III.

All cracks and crevices, which are not easily reached by ordinary cleaning, should have a generous application of gasoline.

THE BEDBUG.

(*Cimex lecturinus*)

The bedbug is an ancient and cosmopolitan insect. The presence of the bedbug in a house is not necessarily an indication of neglect and carelessness on the part of the housewife. This insect may gain access in spite of the best care and the adoption of all reasonable precaution. They can be carried from place to place in trunks and suit cases by travelers. This insect may migrate from one house to another. They bite during the sleep of their victim and under cover of darkness, hiding during daylight in cracks of old fashioned wooden bedsteads, under loose places in the wall paper, in crevices behind picture moulding, in picture frames, about door or window casings, or base boards. Every housewife is alarmed when she discovers the pest in her home and is always

eager to obtain an effective remedy for the extermination of the bedbug.

I.

Crude carbolic acid has been found to be one of the most effective means of destroying bedbugs. This is inexpensive and the fumes are very penetrating. The liquid should be applied with a small brush or feather in all crevices. Walls that are badly infested should be sprayed with equal parts of crude carbolic acid and kerosene.

II.

Kerosene and gasoline will aid in eradicating these nocturnal pests, but can not always be relied upon.

III.

Take everything out of the infected room, plug up all the windows tightly, close all chimneys and empty 1 oz of powdered sulphur on a pan of hot coals, placed in the middle of the floor. Shut the doors and cover all cracks; let the sulphur burn as long as it will. After the sulphur has burned out, paint all the cracks in the floor and around the base board with a strong solution of corrosive sublimate and treat the furniture to the same before replacing it. Corrosive sublimate is deadly poison and should be kept out of reach of children.

IV.

When they make a lodgement in the wall, fill all the apertures with a mixture of soft soap and Scotch snuff. Take the bedstead to pieces and treat that in the same way.

V.

Mix 2 oz. of camphor
4 oz. spirits of turpentine
1 oz. corrosive sublimate
1 pt. alcohol

This should be applied with a brush or a spring-bottom oil can to all cracks and crevices. This is a deadly poison.

FLEAS.

(*Pulex serraticeps* Gerv.)

The fleas that are usually found in houses are the common cat and dog fleas. The adults are wingless. The hind legs are strongly developed to enable them to jump great distances. The

female lays her eggs loosely in the hair of the cat and dog, and are scattered wherever the animal goes. These eggs hatch out in a few days as larvae. In appearance, they resemble the maggots of the house fly, but are very much smaller. These larvae are full grown in two weeks, when they begin spinning a cocoon about themselves lying in a dormant state from 7 to 12 days, when they come out as an adult flea.

I.

The quarters of the cat and dog should be thoroughly cleaned and disinfected so the fleas will not have a chance to lay their eggs. Sometimes they multiply so rapidly, not having anything animal to feed upon, that they attack people, showing a preference for the lower limbs. The bite of the flea is very annoying to most people.

II.

Fleas will not breed in places where they are likely to be disturbed, so the shaking of rugs, carpets and thorough sweeping of floors will aid greatly in keeping them from breeding in the houses.

III.

Gasoline injected in cracks, crevices and places where they cannot be disturbed by any other means, will kill the larvae.

IV.

Creoline Dip sprayed in the cracks and corners of the kennel and on the dog will exterminate them. This should be done every two weeks.

V.

Fresh pyrethrin powder dusted over carpets, rugs and sofas will afford relief. This powder should be left several days before sweeping it up.

VI.

Insect powder dusted thoroughly into the animal's hair will cause the fleas to drop off.

VII.

Dogs should be given a lathery bath of warm water and carbolic soap.

VIII.

Flower of sulphur contains sulphurous acid and is fatal to this pest, but care must be taken not to use it near colored flannels as it often destroys the color.

HEAD LICE.

(*Pediculus capitis* De G.)

This is the most common insect that attacks man. It receives its name from being found on the head, although it sometimes is found on the hairs of the beard. It is parasitic in habits, and belongs to the same order as the bedbug. They puncture the scalp and suck the blood. The nits or eggs adhere very closely to the hairs and are found some distance from the scalp. These eggs hatch in two weeks and are very prolific.

I.

The louse may be combed out of the hair with a fine comb. Kerosene put on the roots of the hair will kill all nits and the adult louse.

II.

Mercurial ointment is very effective.

III.

Vaseline is another that checks this pest by clogging up the breathing pores. Whatever remedy is used, should be kept up every two or three days for at least twenty-one days.

TERMITES.

(*Termes aavipes* Koll.)

Termites, or white ants, as they are sometimes called, are not really a true ant. They have nests and live together similar to the ants but live on decayed wood and vegetable matter. The workers are white, blind, wingless, sexually undeveloped insects. The winged males and females are produced each spring but their wings are not strongly developed, so they are poor flyers. They usually nest in a hollow stump or other infested material. The winged males and females are blackish in color and resemble the true ants, except the crossveins in the wings. They reproduce yearly in the spring.

I.

If this pest infests a building, the surest way is to tear off the pieces that are infested as they bury themselves in the wood and cannot easily be reached by fumigating.

II.

Wood soaked in creosote is excellent in keeping them away.

III.

The greatest difficulty is finding the nest as they tunnel all through the wood, but fumigating with carbon bisulphide is good if one can reach the seat of trouble.

IV.

Gasoline poured into the burrow will destroy them.

BACON OR HAM BEETLE.

(*Dermestes lardaris* Linn)

This insect is about 3-16 in. long and $\frac{1}{8}$ in. broad. The lower half of the wing covers are covered with grayish-yellow scales, with several small black spots on the wings, which sometimes form almost an entire band across the beetle. This insect is always recognized by its feeding, on bacon, ham, lard and cheese. It especially like the fatty portions of the ham. The adult female beetle begins laying her eggs in the spring on meats or nearby, so that the newly hatched larvae may crawl to the meat. The full grown larva are about 9-16 in. long. When full grown, they bury themselves in meat and cheese, and change to the pupa stage. They stay in this state from 3 to 5 days, according to conditions. These beetles reproduce about every six weeks.

I.

If these beetles are found in the meat, the best remedy is to cut away the infested parts and wash in a weak solution of carbolic acid and water, or the good parts may be sliced and fried, lay the pieces in a stone jar and pour over hot lard and cover.

II.

Some find spraying with benzine to be very effective method for destroying the larvae.

III.

Fumigating smokehouses and storerooms with carbon bisulphide or hydrocyanic acid gas will rid the building of this pest. Hydrocyanic acid gas is very dangerous so great care should be taken in handling it.

IV.

The smokehouse should be screened in order to keep it insect proof. The mesh should be fifteen to the inch.

BEAN WEEVIL.

(Acanthoscelides Bruchus oblectus Say)

Dried beans that have been stored away for the winter supply are the ones most affected. Many of the beans showing round holes are where the adult weevils have matured, some may contain small grubs, while in the lower part of box and in corners will be found these small weevils, about $\frac{1}{8}$ inch in length. They are of a brownish, spotted color. New beans may be infected from a few old beans of last year's crop, or by the eggs being deposited in the beans while on the vine.

Fumigation with carbon bisulphide or carbon tetrachloride is the best treatment and should be applied as soon as beans are gathered. Never plant infested beans.

The references below were consulted in preparation of this work.

LITERATURE.

Andrew Boss. Meats on the Farm. Farmers Bul. No. 183, U. S. Dept. of Agri.

Dr. L. O. Howard. Some facts about Malaria. Bul. No. 450. U. S. Dept. of Agri.

Dr. L. O. Howard. House Flies. Farmers Bu. No. 459, U. S. Dept. of Agri.

Dr. L. O. Howard. Remedies and Preventives against Mosquitoes, Farmers Bul. No. 444, U. S. Dept. of Agri.

Dr. L. O. Howard. Household Insects. Bul. No. 4, U. S. Dept. of Agri.
O. F. Hunziker. The Fly and its Relation to Economic Milk Production Cir. No. 43. Purdue University, Purdue, Ind.

E. C. Levy. The Extermination of Mosquitoes. Health Dept. Richmond, Va.

C. L. Marlett. The True Clothes Moths, Cir. No. 36. U. S. Dept. of Agri.

C. L. Marlett. Cockroaches. Cir. No. 51. U. S. Dept. of Agri.

C. L. Marlett. The Bedbug. Cir. No. 47, U. S. Dept. of Agri.

H. J. Quale. Mosquito Control. Calif. Agri. Expt. Bul. No. 178.

R. D. Whitmarsh. Insect Pest of the Household. Ohio Expt. Station Bul. No. 253.

BOOKS.

Lord Avebury. Ants, Bees and Wasps.

Kellgg. American Insects.

Comstock. Insects.

Sanderson. Insect Pests of Farm, Garden and Orchard.

Hodge. Nature Study and Life.

W. C. O. Kane. Injurious Insects.

L. H. Bailey. Farm and Garden Rule Book.